

REMARKS

INTRODUCTION

In accordance with the foregoing, no claims have been canceled, amended, or added. Claims 1-14 are pending and under consideration. Reconsideration is respectfully requested.

REJECTION UNDER 35 U.S.C. §103 OF CLAIMS 1-3

In the Office Action, at page 2, claims 1-3 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,746,896 issued to Shi et al. ("Shi") in view of the Admitted Prior Art ("APA"). The reasons for the rejection are set forth in the Office Action and therefore not repeated. The rejection is traversed and reconsideration is requested.

Regarding claim 1, the Applicants respectfully traverse the rejection because the proposed combination fails to teach or suggest:

severing the semiconductor wafer into the plurality of the semiconductor chips.

The Examiner cites Shi for teaching or suggesting the severing operation as recited. However, Shi mentions dicing or singulating a WLCFU material coated wafer into individual chips *without damaging the coated WLCFU layer to produce a diced wafer*. *Shi*, col. 5, lines 21-23. Then, the diced wafer of Shi is flipped over and placed on tacky film that is on carrying film to produce a flipped wafer. *Shi*, col. 5, lines 23-25. In contrast, claim 1 recites severing the semiconductor wafer into a plurality of semiconductor chips. As noted in the application, it is an aspect of the present invention to provide a method of surface-mounting a semiconductor chip on a PCB having a simplified process with no need to use a package (such as a chip tray or feeder tape) to transfer a semiconductor chip in the middle of the manufacturing process. The Applicants respectfully submit that Shi cannot properly be relied upon for teaching or suggesting the severing operation as recited. The Applicants also submit that the APA fails to make up for this deficiency.

As neither Shi nor the APA teach or suggest all of the features of claim 1, the proposed combination of Shi and the APA fails to establish a prima facie case of obviousness. Accordingly, claim 1 is deemed to be allowable over the art of record. Therefore, withdrawal of the §103 rejection is respectfully requested.

The Applicants also respectfully submit that the Office Action fails to provide a valid line of reasoning from the prior art to combine the teachings of Shi and the APA. Rather, the Office Action states on page 3:

[I]t would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the process of forming the device of Shi by forming a flip chip type semiconductor chip on the PCB mounted with electronic components for a design choice dependent on the fabrication process being employed, as taught by APA.

The Applicants respectfully submit that this, at best, amounts to an improper hindsight reconstruction of the invention. Accordingly, withdrawal of the 103 rejection is respectfully requested.

Regarding the rejection of claims 2 and 3, these claims depend directly or indirectly on independent claim 1, and are therefore believed to be allowable for at least the reasons noted above.

REJECTION UNDER 35 U.S.C. §103 OF CLAIMS 4-14

In the Office Action, at page 3, claims 4-14 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,746,896 issued to Shi et al. ("Shi") in view of U.S. Patent No. 6,881,607 issued to Farnworth ("Farnworth"). The reasons for the rejection are set forth in the Office Action and therefore not repeated. The rejection is traversed and reconsideration is requested.

Regarding claim 4, the Applicants respectfully traverse the rejection because the proposed combination fails to teach or suggest:

curing the underfill material to achieve a semisolid state.

On page 4 of the Office Action, the Examiner acknowledges that Shi does not disclose curing the underfill material to achieve a semisolid state. The Examiner instead cites Farnworth for teaching or suggesting this operation. However, Farnworth only mentions immersing a semiconductor device assembly into a reservoir of liquid resin that is used to create a dam structure. *Farnworth*, col. 4, lines 35-67. A laser light beam is used to cure select portions of the liquid resin. *Farnworth*, col. 13, lines 29-45. In contrast, claim 4 recites coating the surface of the semiconductor wafer with underfill material and curing the underfill material to achieve a semisolid state. Accordingly, the Applicants respectfully submit that Farnworth cannot properly be relied upon for teaching or suggesting the curing operation, as recited.

Regarding claim 11, the Applicants respectfully traverse the rejection because the proposed combination fails to teach or suggest:

curing the underfill material to achieve a semisolid state;
severing the flip chip type semiconductor wafer into a plurality of flip chip semiconductor chips;

As discussed above, Shi does not teach or suggest the severing operation, as recited. Also as discussed above, Farnworth does not teach or suggest the curing operation as recited.

As neither Shi nor Farnworth teach or suggest all of the features of claims 4 and 11, the proposed combination of Shi and Farnworth fails to establish a *prima facie* case of obviousness. Accordingly, claims 4 and 11 are deemed to be allowable over the art of record. Therefore, withdrawal of the §103 rejection is respectfully requested.

The Applicants respectfully submit that the Office Action fails to provide a valid line of reasoning from the prior art to combine the teachings of Shi and Farnworth. Rather, the Office Action states on page 4:

[I]t would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the process of Shi by performing a step of curing the underfill material to achieve a semisolid state because such curing the underfill material would achieve a semisolid state for adjusting the size, as taught by Farnworth (col. 14, lines 42-45).

Lines 42-45 of Farnworth discuss adjusting the size of a laser light beam. The Applicants fail to appreciate how a teaching of adjusting a laser light beam provides a motivation to combine the teachings of Shi and Farnworth. Accordingly, withdrawal of the 103 rejection is respectfully requested.

Regarding the rejection of claims 5-10 and 12-14, these claims depend directly or indirectly from one of independent claims 4 or 11, and are therefore believed to be allowable for at least the reasons noted above.

CONCLUSION

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot. And further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

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If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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